



## Editorial

# Electronic medical records increasingly take thinking away from spine surgery

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I have been practicing Medicine for over 40 years in both private and academic settings, and have published over 400 peer-reviewed articles/chapters. I started when computers in medicine were limited; doctors “talked with each other” about cases, and spent time talking with and examining patients. Most physicians were in the private practice of medicine which I had known from my father, Joseph A. Epstein MD, a neurosurgeon, and my uncle Bernard S. Epstein, M.D. (one of the first neuroradiologists and author of several textbooks). What I now see evolving is what I am writing about in this editorial. I would, along with Surgical Neurology International, be interested in comments from other spine surgeons about this editorial.

The electronic medical record (EMR) is increasingly taking the thinking out of performing spine surgery, thus putting patients at increased risk. EMRs, by automatically populating subsequent notes, allow mistakes made by spine residents and/or attending surgeons to permeate the chart, potentially leading to wrong level, wrong side, and wrong site surgery. Further, few spine residents/attending surgeons have integrated the culture of “talking” to colleagues, which shrinks rather than expands differential diagnoses, more often leading to missed diagnoses. Finally, when operative notes become increasingly “templated,” what actually happened at surgery (i.e. especially errors), are no longer accurately reported.

## MR/CT REPORTS IN THE EMR “AUTOMATICALLY POPULATE” NEXT NOTES LEADING TO MISTAKES

Typically, the electronic medical record (EMR) automatically populates subsequent notes in spine and other patients’ charts. This does not, however, mean that their content is necessarily read and/or evaluated/reassessed by the next resident or spine surgeon to come along. Rather, this often leads to events/findings not being reported if there is no free text option, or if the content simply does not fit into any predetermined pull-down menu. This increasingly leads spine surgery residents to summarize findings or events while often leaving out critically important details. These errors then populate the EMR and subsequent computer generated notes, thus removing the impetus to think independently and/or actually go back and read and/or reinterpret radiologists’/neuroradiologists’ reports. For example, an initial MR/CT report that cites the wrong level of a disc herniation may permeate the entire EMR, and result in a wrong-level/wrong side/wrong site surgery. Further shortcomings of the EMR automatically populating the record may include the failure to consider or reconsider other critical differential diagnoses, and thus leave patients with

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fixed neurological injuries that could have been avoided had the correct diagnosis been established, and had a potentially necessary operation been performed in a timely fashion. Such instances classically include patients with epidural spinal abscesses, where initial emergency room evaluations fail to consider this amongst the differential diagnoses for back pain, thus leading to the failure to order appropriate MR/CT studies, and lack of timely surgical intervention.

### **SPINE SURGEONS RARELY SPEAK WITH RADIOLOGY/NEURORADIOLOGY ABOUT MR/CT FINDINGS**

Before performing spine operations, spine surgeons used to speak with radiology/neuroradiology in addition to reading the MR/CT reports and reviewing the films themselves. Such talking between professionals led to ordering more appropriate preoperative studies, considering additional differential diagnoses, along with consideration of different treatment options. The simple phone call or direct person-person encounter better defined the pathology, the significance of disease, the need for surgery, along with pin-pointing the correct level, side, and site of disease. Now, the electronic medical records (EMR) with increasing time constraints allotted for each patient evaluation have largely eliminated “thinking,” and have created a generation of spine surgeons focused on “regurgitating” prior radiographic reports, and summarizing “surgical diagnoses.” Why is this happening? Is it due to a lack of interpersonal relationships, particularly for a younger computer-raised generation of physician who did not learn those skills growing up? Or is it time or money limitations? This you don’t even need to ask; I certainly learned this quickly changing from working in a private neurosurgical practice to transitioning to working full-time for a healthcare system that rigidly imposed greater time constraints.

### **IT’S NOT MY FAULT, IT WAS WHAT WAS IN THE EMR/CHART**

Too often, attending spine surgeons, particularly in academic centers, blame the residents for not “knowing the patient” and/or “performing the wrong operation.” Nevertheless, attending spine surgeons are still the “captains of the ship”, and, as such, are primarily responsible for the patients regarding any surgery-related decisions and/or errors. This is most prominent where MR/CT reports contain mistakes; how often have you seen that the official reports cite a specific level, site or side in the text for a disc herniation, but the final summary cites a different location? This is precisely why the films are supposed to be available in the operating room according to the Joint Commission protocols (i.e., time outs). Further, now that you have the hospital PAC system in the operating room (i.e., PACS defined as the “picture archiving and communication system (PACS)), spine surgeons are much more limited as to how

many different studies they may simultaneously view. So you get to the operating room table, and time outs are performed. But who did their homework? The resident? The attending? No one? And therein lies the problem. Despite the EMR and PACS system, the attending spine surgeon must still have “ownership” of the patient’s individual case, and be responsible for performing the right operation on the right patient at the right level for the right indications.

### **ALTHOUGH INITIAL MR/CT RADIOLOGY READINGS MAY BE CORRECT, THE EMR MAY POPULATE WRONG INTERPRETATIONS BY RESIDENTS AND/OR ATTENDING SPINE SURGEONS**

Spine surgeons must carefully select and care for patients to ensure they receive optimal treatment. The initial patient evaluation is so critical for discerning whether the patient does or does not require surgery, and/or if there is a medical or neurological problem. Certainly, performing a complete history and neurological exam are important, as many spine surgeons have seen patients misdiagnosed with spine disease but in fact have neurological disorders (i.e., Multiple Sclerosis or Amyotrophic Lateral Sclerosis, etc.). Patients with potential surgical disease are often sent initially for MR (i.e., CT studies reserved for those with pacemakers, etc.). Once that study is read, in addition to the treating surgeon reviewing the study, how many then routinely speak with the radiologist? The major benefit at this point is that the surgeon has the clinical information that can change/alter the radiologists’ interpretation of studies. In short, putting two heads together adds a layer of combined expertise and protection; it both expands and then contracts/focuses two different specialty clinicians to arrive at the correct differential diagnosis. Failure to maintain this avenue of direct communication may result in missed diagnoses, and even the wrong surgical procedure.

### **SPINE SURGEONS’ TEMPLATED OPERATIVE EMR NOTES MAY INACCURATELY REFLECT WHAT WAS DONE DURING SURGERY**

When attending spine surgeons dictate templated operative notes, their reports may fail to accurately indicate what was actually done. Rather, you have to read between the lines and look at the postoperative sequelae to discern whether what was described was actually performed and/or whether an “unreported” mistake was made. One example of this took place years ago when I saw a patient who came in for a second opinion after having a lumbar discectomy performed 1 year previously. That patient’s MR showed no significant peridural scarring at the operative level. During the second operation, the incision was found to be just skin deep; nothing else had been done. Nevertheless, the patient’s operative report from the prior surgery went on in great detail for four pages. Many

other examples are now found in medicolegal cases, where the described events either never happened, or “mistakes/errors” were totally omitted.

## **SUMMARY**

The art of thinking by spine surgery residents and attendings is increasingly being threatened by the electronic medical record (EMR). By the EMR automatically populating future notes, initial MR/CT mistakes may not get corrected even prior to surgery. Further, the failure to talk to radiology/neuroradiology colleagues – particularly about complex cases - the failure to explore potential additional correct differential diagnoses, likely has resulted in more misdiagnosed cases and wrong operations. Finally, relying on largely templated operative notes to figure out what was actually done at surgery has proven to be increasingly misleading.

## **Declaration of patient consent**

Patient's consent not required as there are no patients in this study.

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Nil.

## **Conflicts of interest**

There are no conflicts of interest.

## **Commentary**

Nancy, you describe WHAT is happening in neurosurgery, but not WHY is it happening. Is it the fault of EMRs? Or is it a deeper reason? Mindless adoption of technology which has good values is allowing us to transmit information between others easily, search large data bases of information about our patients, decrease repetitive tasks, and make us more time efficient. However, technology's downsides are that it is not perfect, is in fact flawed, and is not available in all sites. Further, many of these systems deliberately do not communicate with each other (i.e. because companies have their own systems to make money and keep them unique rather than being commonly accessed and user friendly). The technology takes doctors personal time from patients, and the result is that the EMR contains much useless information which is expanded and not condensed (i.e. as was done in the past by successive physician input). Insurance systems do not reward thinking and experience. A doctors' compensation is based on his/her detailed record keeping. And now doctors have scribes who enter this information into the computer system, adding more chances for error. Further, technology is not about people; it is about people interacting with a screen, and not a real live patient. It has depersonalized our civilization. Are we becoming robots? Is this yet another example of that?

## **Comments from James I Ausman, M.D., Emeritus Editor-In-Chief, Surgical Neurology International**

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